contents

number 1

ECOLOGY

Contents and Enantiomeric Compositions of Monoterpene Hydrocarbons in Xylem Oleoresins from Four *Pinus* Species Growing in Cuba. Comparison of Trees Unattacked and Attacked by *Dioryctria horneana*
I. Valterová, K. Sjödin, J. Vrkoč & T. Norin 1

Inhibition of Fungal Growth by an Aqueous Extract and Saponins from Leaves of *Maesa ramentacea* Wall
S. Phongpaichit, E. F. Schneider, A. K. Picman, P. Tantiwachwuttikul, P. Wiriyachitra & J. T. Arnason 17

Photosynthetic Enzyme Activities in *Vetiveria zizanioides* Cultivated in Temperate Climates
M. Maffei, S. Scannerini, G. Berta & M. Mucciarelli 27

SYSTEMATICS

Ancient Diversity of the Glucose-6-phosphate Isomerase Genes
J. Hattori, B. R. Baum & B. L. Miki 33

Genetic and Morphological Differentiation among Populations of the Green Toad *Bufo viridis* from Northern Greece
Y. Karakousis & P. Kyriakopoulou-Sklavounou 39

Allozyme Variation in *Virgilia oroboides* (Tribe Podalyrieae: Fabaceae)
H. Van der Bank, M. Van der Bank & B.-E. Van Wyk 47

Electrophoretical Evidence of Variation in Populations of the Fodder Legume *Chamaecytisus proliferus* from the Canary Islands
M. D. Sanchez-Yelamo, M. C. Espejo-Ibañez, J. Francisco-Ortega & A. Santos-Guerra 53

Fatty Acid Composition of Freshwater Phytoplankton During a Red Tide Event
G. E. Napolitano, H. Heras & A. J. Stewart 65

Distribution of Diacylglycerylhomoserines, Phospholipids and Fatty Acids in Thirteen Moss Species from Southwestern Siberia
V. M. Dembitsky & T. Rezanka 71

Phenolic Characters of British Hybrid Taxa in *Equisetum* Subgenus Equisetum
M. Veit, K. Bauer, C. Beckert, B. Kast, H. Geiger & F.-C. Czygan 79

CONTENTS

A Chemical Dichotomy in Quinolizidine Alkaloid Accumulation Within the Section *Spartioides* of the Genus *Genista* (Fabaceae: Genisteae)
R. Greinwald, I. Van Rensen, M. Veit, P. Canto & L. Witte 89

Flavonoids of Species of *Cuphea* (Lythraceae) from Brazil
D. Y. A. C. Santos, M. L. F. Salatino & A. Salatino 99

Chemical Investigation of *Polylepis incana* (Rosaceae)
S. Catalano, P. L. Cioni, M. Martinozzi, V. de Feo & I. Morelli 105

NEW SOURCE REPORT

Lignans from the Leaves of *Premna recinosa* (Verbenaceae)
S. Habtemariam, A. I. Gray & P. G. Waterman 109

BOOK REVIEW 111

number 2

ECOLOGY

New Cardiac Glycosides Containing 2-Deoxyhexoses from the Defensive Secretion of Adult *Chrysolina banksi* (Coleoptera: Chrysomelidae)
D. Daloze, F. Broeders, J.-C. Braekman, J. Araujo & J. M. Pasteels 113

Soluble Phenolic Constituents from *Cuscuta reflexa* and *Cuscuta platyloba*
C. Löffler, A. Sahm, V. Wray, F.-C. Czygan & P. Proksch 121

SYSTEMATICS

The Ubiquity of Fluorine amidst the Taxonomic and Mineralogical Diversity of Ascidian Spicules
F. Monniot, P. Clement & J.-P. Souron 129

Amylase Polymorphism in Crustacea Decapoda: Electrophoretic and Immunological Studies
A. Van Wormhoudt, G. Gourreau & G. Le Moullac 139

Comparison of Three Anacardiaceae Gum Exudates
G. León de Pinto, M. Martinez, J. A. Mendoza, E. Ocando & C. Rivas 151

Distribution of Alkaloids and Tannins in the Crassulaceae
J. F. Stevens, H.'t Hart, R. C. H. J. Van Ham, E. T. Elema, M. M. V. X. Van den Ent, M. Wildeboer & J. H. Zwaving 157

Analysis of Leaf Oils from a *Eucalyptus* Species Trial
H. Li. & J. L. Madden **167**

The Distribution of Phenylpropanoid Glycosides in Chilean *Calceolaria* Spp.
A. Di Fabio, A. Bruni, F. Poli, J. A. Garbarino, M. C. Chamy, M. Piovano & M. Nicoletti **179**

Flower Flavonol and Anthocyanin Distribution in Subgenus *Rosa*
Y. Mikanagi, M. Yokoi, Y. Ueda & N. Saito **183**

A Comparative Study of Seed Lipid Components of Nicotianeae (Solanaceae)
D. M. Maestri & C. a. Guzmán **201**

NEW SOURCE REPORTS

Flavonoids of *Raoulia* Hook. f. ex Raoul (Asteraceae: Gnaphalieae)
A. Reid & B. A. Bohm **209**

Occurrence of Diosgenin in *Borderea pyrenaica*, an Endemic Dioscoreaceae from the Pyrénées
C. Cerdon, P. Brenac & Y. Sauvaire **211**

number 3

ECOLOGY

HPLC Isolation and Identification of Flavonoids from White Birch *Betula pubescens* Leaves
V. Ossipov, K. Nurmi, J. Loponen, N. Prokopiev, E. Haukioja & K. Pihlaja **213**

SYSTEMATICS

Genetic Structure of Brackish Water Clams (*Rangia* spp.)
D. W. Foltz, S. K. Sarver & A. W. Hrincevich **223**

Biochemical Systematics of Sea Eagles (Genus *Haliaeetus savigny* 1809), with a Note on Allozyme Differentiation Between Black and Red Kites (Genus *Milvus* L. 1758)
A. Schreiber & T. Weitzel **235**

Relationships among Palearctic *Hyla*: Insights from Immunology
C. J. Riehl, J. T. Lell & L. R. Maxson **245**

Genetic Variation in Two Economically Important *Aloe* Species (Aloaceae)
H. Van der Bank, B.-E. van Wyk & M. Van der Bank **251**

Biochemical Genetic Variation in Four Wild Populations of *Aspalathus linearis* (Rooibos Tea)
M. Van der Bank, B.-E. van Wyk & H. Van der Bank **257**

Vacuolar Flavonoids of Rocky Mountain Maple, *Acer glabrum* Torrey (Aceraceae)
D. E. Justice, A. R. Reid & B. A. Bohm **263**

Chemotaxonomic Survey of Anthraquinones and Pre-anthraquinones in Roots of *Aloe* Species
B.-E. van Wyk, A. Yenesew & E. Dagne **267**

Chemotaxonomic Significance of Anthraquinones in the Roots of Asphodeloideae (Asphodelaceae)
B.-E. van Wyk, A. Yenesew & E. Dagne **277**

New and Rare Flavonol Glycosides from *Asplenium trichomanesramosum* as Stable Chemotaxonomic Markers
T. Iwashina, S. Matsumoto, M. Nishida & T. Nakaike **283**

The Homology of Red Flower Colour in *Crassula, Cotyledon* and Tylecodon (Crassulaceae)
B.-E. van Wyk & P. J. D. Winter **291**

Chemotaxonomic Value of Anthocyanins in the Tribe Liparieae (Fabaceae)
B.-E. van Wyk, P. J. D. Winter & A. L. Schutte **295**

Variation in Volatile Leaf Oils of the Tasmanian *Eucalyptus* Species—1. Subgenus *Monocalyptus*
H. Li, J. L. Madden & B. M. Potts **299**

Flavonoid Profiles Variation in *Armeria maritima* (Mill.) Willd
J. Lauranson, X. Vekemans, C. Lefebvre & M. Jay **319**

Clerodane Diterpenoids from *Polyalthia longifolia* var. *pendulla*
C. M. Hasan, M. A. Hossain & M. A. Rashid **331**

Sesquiterpene Lactones from *Hymenoxys rusbyi* (Asteraceae)
A. A. Ahmed, M. A. El-Ela, N. S. Hussein, T. J. Mabry & M. W. Bierner **333**

Flavonoids from Leaves and Flowers of *Liabum polymnioides* and *L. candidum* (Asteraceae). Chemotaxonomical Significance
B. E. Juarez, M. E. Mendiondo & P. Seeligmann **335**

Alkaloids from *Glaucium corniculatum* (L.) of Egyptian Origin
S. A. M. Al-Wakeel, M. H. Moubasher & M. F. Roberts **337**

Furoquinoline from *Evodia fatraina*
N. Ravelomanantsoa, P. Rasoanaivo & M. Delmas **339**

BOOK REVIEWS **341**

number 4

The Floral Odour of *Arum maculatum*
G. C. Kite **343**

Chemical Variation and Defense of *Encelia farinosa*
A. Kunze, C. Müller & P. Proksch **355**

Phylogenetic Relationships of *Barbus peloponnesius* Valenciennes, 1842 (Osteichthyes: Cyprinidae) from Greece and Other Species of *Barbus* as Revealed by Allozyme Electrophoresis
Y. Karakousis, A. Machordom, I. Doadrio & P. S. Economidis.. .. .. **365**

Chemisty of Verongida Sponges—V. Brominated Metabolites from the Caribbean Sponge *Pseudoceratina* sp.
A. Aiello, E. Fattorusso, M, Menna & M. Pansini **377**

Use of Cuticular Lipids in Grasshopper Taxonomy: A Study of Variation in *Schistocerca shoshone* (Thomas)
R. F. Chapman, K. E. Espelie & G. A. Sword **383**

Molecular Analysis of Cucurbitaceae Genome: Reassociation Kinetic Classes and its Evolutionary Significance
M. K. Pasha & S. P. Sen **399**

Variation in the Subtropical Group of *Dactylis glomerata* L.— 1. Evidence from Allozyme Polymorphism
E. Sahuquillo & R. Lumaret **407**

Nectar Sugar Composition in *Erica*
K. Barnes, S. W. Nicolson & B.-E. van Wyk **419**

Essential Oils of Spearmint (Carvone-rich) Plants from the Island of Crete (Greece)
S. Kokkini, R. Karousou & T. Lanaras **425**

Essential Oil Variability of *Thymus hyemalis* Growing Wild in Southeastern Spain
F. Sáez **431**

Analysis of Foliar Monoterpenoid Content in the California Bay tree, *Umbellularia californica*, Among Populations Across the Distribution of the Species
R. J. L. Goralka & J. H. Langenheim 439

Chemotaxonomic Value of Melampolides in *Espeletia* Species (Asteraceae)
R. D. Torrenegra & A. N. Tellez A. 449

Exudate Flavonoids of *Eupatorium cannabinum*
J. F. Stevens, E. T. Elema & E. Wollenweber 451

Flavonoids and Coumarins of *Haplopappus multifolius*
J. Nuñez-Alarcón & M. Quiñones 453

Iridoid Glycoside Constituents of *Castilleja tenuiflora*
M. Jimenez E., M. E. Padilla, R. Reyes Ch., L. M. Espinosa, E. Melendez & A. Lira-Rocha 455

Exudate Flavonoids in Some Solanaceae
E. Wollenweber & M. Dörr 457

Flavonoids and Diterpenoids in the Trichome Resinous Exudates from *Pseudognaphalium cheiranthifolium, P. heterotrichium* and *P. vira vira*
A. Urzúa, R. Torres, C. Bueno & L. Mendoza 459

number 5

ECOLOGY

Highly Mosquitocidal Isolates of *Bacillus thuringiensis* subspecies *kenyae* and *entomocidus* from Mexico
J. López-Meza, B. A. Federici, W. J. Poehner, A. Martinez-Castillo & J. E. Ibarra 461

Terpene Changes Due to Maturation and Canopy Level in Douglas-fir (*Pseudotsuga menziesii*) Flush Needle Oil
H. A. Gambliel & R. G. Cates 469

Epicuticular Lipids from Azalea (*Rhododendron* spp.) and Their Potential Role in Host Plant Acceptance by Azalea Lace Bug, *Stephanitis pyrioides* (Heteroptera: Tingidae)
J. A. Balsdon, K. E. Espelie & S. K. Braman 477

SYSTEMATICS

Mitochondrial DNA Sequence Variation and Genetic Differentiation among Colubrine Snakes (Reptilia: Colubridae: Colubrinae)
T. J. Lopez & L. R. Maxson **487**

Clone Bank and Physical Map of *Lopezia miniata* Lag. ex DC. ssp. *miniata* (Onagraceae) Chloroplast DNA
S. L. O'Kane, Jr. **507**

Chemical Characteristics of Oleoresins from Chinese Pine Species
Z. Song, Z. Liang & X. Liu **517**

Variation in the Subtropical Group of *Dactylis glomerata* L.—2. Evidence from Phenolic Compound Patterns
M. Jay & R. Lumaret **523**

Alkaloid Variation in the *Lupinus pusillus* group (Fabaceae: tribe Genisteae)
B. E. van Wyk, R. Greinwald & L. Witte **533**

Chemotaxonomic Approach to the Genus *Euchresta* Based on Prenylflavonoids and Prenylflavanones in Roots of *Euchresta formosana*
N. Matsuura, M. Linuma, T. Tanaka & M. Mizuno **539**

Alkaloids of the Genus *Poecilanthe* (Leguminosae: Papilionoideae)
R. Greinwald, P. Bachmann, G. Lewis, L. Witte & F.-C. Czygan **547**

Fingerprinting the Selection Process of Ancient Roses by Means of Floral Phenolic Metabolism
O. Raymond, J.-P. Biolley & M. Jay **555**

NEW SOURCE REPORTS

Natural Distribution of Flavonoids in *Tagetes minuta*
L. R. Abdala & P. Seeligmann **567**

Leaf Flavonoids of *Achillea ligustica* and *Achillea holosericea*
O. Tzakou, M. Couladis, E. Verykokidou & A. Loukis **569**

Flavonoids and Alkaloids from *Cuscuta* (Cuscutaceae)
R. Garcia M., S. Erazo G. & R. C. Peña **571**

Flavonoid Glycosides from *Minthostachys spicata* (Lamiaceae)
F. Senatore & V. De Feo **573**

Non-protein Amino Acids from *Gymnocladus dioica*
M. Pan, M. S. Bonness & T. J. Mabry **575**

Wax Composition of the Two Cacti *Hylocereus purpusii* and *Stenocereus beneckii*
E. Wollenweber & M. Dörr **577**

BOOK REVIEW **579**

number 6

ECOLOGY

Loss of Monoterpenes From *Umbellularia californica* Leaf Litter
S. E. Wood, J. F. Gaskin & J. H. Langenheim **581**

SYSTEMATICS

Intraspecific and Interspecific Patterns of Allozyme Variation Among Species of *Biomphalaria* Preston, 1910 (Gastropoda: Planorbidae)
S. M. Bandoni, M. Mulvey & E. S. Loker **593**

Genetic Structure of Mosquitofish Populations in the Altamaha and Ogeechee Drainages of Georgia: Reporting an Undescribed Form in the Ocmulgee River
J. D. Hernandex-Martich, J. M. Novak, M. H. Smith & P. E. Johns .. **617**

Bacterial Carotenoids 53*, C_{50}-Carotenoids 23†; Carotenoids of *Haloferax volcanii* versus other Halophilic Bacteria
M. Rønnekleiv & S. Liaaen-Jensen **627**

Alkaloidal Variation in *Genista lobelii* s.l. (Fabaceae)
J. Kirch, M. Veit, H. Wätzig, R. Greinwald & F.-C. Czygan **635**

The Alkaloid Pattern of *Plagiocarpus axillaris* (Fabaceae: Brongniartieae)
R. Greinwald, J. H. Ross, L. Witte & F.-C. Czygan **645**

A Survey of Alkaloids in *Templetonia biloba* (Benth.) Polhill (Fabaceae: Brogniartieae)
R. Greinwald, C. Henrichs, G. Veen, J. H. Ross, L. Witte & F.-C. Czygan **649**

Flavonoid Profiles in Leaves, Flowers and Stems of Forty-nine Members of the Phaseolinae
C. A. Williams, J. C. Onyilagha & J. B. Harborne **655**

Occurrence of Prenylated Flavonoids and Oligostilbenes and Its Significance for Chemotaxonomy of Genus *Sophora* (Leguminosae)
M. Ohyama, T. Tanaka, J. Yokoyama & M. Linuma **669**

NEW SOURCE REPORTS

Isoquinoline Alkaloid Constituents of *Spirospermum penduliflorum* and *Strychnopsis thouarsii* (Menispermaceae)
P. Rasoanaivo, S. Ratsimamanga-Urverg & A. Rakoto-Ratsimamanga **679**

Flavonoid Glycosides from *Arnica amplexicaulis and Arnica molis*
I. Merfort, C. M. Paβreiter & G. Willuhn **681**

number 7/8

ECOLOGY

Effect of Flavonoids on Mycelial Growth of *Verticillium albo-atrum*
A. K. Picman, E. F. Schneider & J. Picman.. .. .. **683**

Brain Gangliosides and Cold-adaptation in High-Antarctic Fish
K. Becker, A. P. A. Wöhrmann & H. Rahmann **695**

Comparative Dynamics of Ptaquiloside and Pterosin B in the Two Varieties (*caudatum* and *arachnoideum*) of Neotropical Bracken Fern (*Pteridium aquilinum* L. Kuhn)
M. E. Alonso-Amelot, S. Rodulfo-Baechler & R. Jaimes-Espinoza .. **709**

Large-scale Production and Chemical Characterization of the Protective Higher Plant Allelochemicals: L-Canavanine and L-Canaline
M. Bass, L. Harper, G. A. Rosenthal, S. N. Phuket & P. A. Crooks **717**

SYSTEMATICS

Review

The Chemistry of the Cystoseiraceae (Fucales: Pheophyceae): Chemotaxonomic Relationships
R. Valls & L. Piovetti **723**

Carotenoids from Further Prasinophytes
E. S. Egeland, W. Eikrem, J. Throndsen, C. Wilhelm, M. Zapata & S. Liaaen-Jensen **747**

The Chemistry of the Abdominal Gland Secretion of Six Species of the Rove Beetle Genus *Bledius*
J. L. M. Steidle & K. Dettner **757**

Genetic Relationship Between *Salix exigua* and Other North American Willows (*Salix* L.): Evidence from Allozyme Variation
D. K. X. Chong, L. Zsuffa & F. A. Aravanopoulos **767**

Pyruvate Kinase Isozymes: Ancient Diversity Retained in Modern Plant Cells
J. Hattori, B. R. Baum, S. G. McHugh, S. D. Blakeley, D. T. Dennis & B. L. Miki **773**

Cyclic Hydrozamic Acids in Dicotyledonous Plants
K. Pratt, P. Kumar & W. S. Chilton **781**

Qualitative and Quantitative Comparison of Volatile Sulphides and Flavour Precursors in Different Organs of Some Wild and Cultivated Garlics
J. Boscher, J. Auger, N. Mandon & S. Ferary **787**

Genetic Variation in *Haworthia pumila* and H. *herbacea*
G. Campbell, H. Van der Bank & B.-E. van Wyk **793**

A Chemotaxonomic Survey of Kaurene Derivatives in the Genus *Alepidea* (Apiaceae)
C. W. Holzapfel, B.-E. van Wyk, A. De Castro, W. Marais & M. Herbst **799**

The Chemotaxonomic Significance of Root Anthraquinones and Pre-anthraquinones in the Genus *Lomatophyllum* (Asphodelaceae)
B.-E. van Wyk, A. Yenesew & E. Dagne **805**

Chemotaxonomic Study of *Codonopsis* (Family Campanulaceae) and its Related Genera
Z.-T. Wang, G.-Y. Ma, P.-F. Tu, G.-J. Xu & T.-B. Ng **809**

Isonenzymatic Characterization of Potentially Useful Forage Shrubs Belonging to the Genus *Cytisus* and Allies (Genistea: Leguminosae)
F. Gonzlez-Andrés & J.-M. Ortiz **813**

Ecogeographic Variation in Seed Fatty Acids of *Austrocedrus chilensis*
R. S. Dodd & Z. A. Rafii **825**

A Chemotaxonomical Study of *Sideritis massoniana* Taxa
B. M. Fraga, M. G. Hernandez, J. M. H. Santana, D. Terrero & M. F. Galvan **835**

Composition and Properties of *Albizia lebbeck* Gum Exudate
M. Martínez, G. León de Pinto, S. Alvárez, N. González de Troconis, E. Ocando & C. Rivas **843**

Comparison of Two *Pithecellobium* Gum Exudates
G. León de Pinto, M. Martínez, O. Gutiérrez de Gotera, A. Vera, C. Rivas & E. Ocando **849**

The Occurrence of Phenylpropanoid Glycosides in Italian *Orobanche* spp.
M. Serafini, A. Di Fabio, S. Foddai, M. Ballero & F. Poli **855**

Biodiversity among West African *Rhizophora*: Foliar Wax Chemistry
R. S. Dodd, F. Fromard, Z. A. Rafii & F. Blasco.. .. .. **859**

NEW SOURCE REPORTS

Identification of Histidine Dipeptides in Monotreme Muscle
J. Baldwin **869**

Flavonoids in *Tagetes zipaquirensis* and their Chemosystematic Significance
L. R. Abdala & P. Seeligmann **871**

Exudate Flavonoids in a Tropical Weed, *Chromolaena odorata* (L.) R. M. King et H. Robinson
E. Wollenweber, M. Dörr & R. Muniappan.. .. .. **873**

Grilactone and Other Terpenoids from *Anthriscus nitida*
B. Muckensturm, F. Diyani & J.-P. Reduron **875**

Indole Alkaloids from *Rauwolfia sprucei*
A.Madinaveitia, E. Valencia, J. Bermejo & A. G. Gonzalez **877**

Podocarpusflavone A from the Leaves of *Trattinnickia glaziovii*
A. C. Siani & M. N. de S. Ribeiro **879**